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ABSTRACT

Cognitive effects in children's learning of altruistic behavior were tested with an adaptation of Aronfreed's test design and machine. Children in grades 1-4 were presented with a machine with 2 levers. One lever, when pressed, released bubble gum, and the other turned on a light. For two of the three groups the experimenter exclaimed delightedly when the light came on. A story (unrelated to the test experience but involving a similar idea of self-sacrifice) was read to one of the two groups before the test. Following the test, all groups were given an opportunity to give any amount of their bubble gum to a charity box for needy children. For the test experience in grades 2-4, the results in the story group were significantly different from the other groups, but results in the second (non-story) group were not significantly different from the control group. The results for the charity box experience were the same, except that the differences involved grade 1 also. An experiment was conducted to test whether the cognitive treatment would continue to be effective over a five-day period. No significant loss of effectiveness was found. It was concluded that cognitive factors can influence children's altruistic behavior, but in grade 1 only in a familiar situation (the charity box). (A number of pages of the document may reproduce poorly due to marginal legibility.) (KM)

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COGNITIVE EFFECTS ON THE CHILD'S INTERNALIZATION OF ALTRUISTIC BEHAVIOR

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Special recognition is given to several King College seniors in psychology over the past three years (Myra Newland Rosenberry, Danny Minor, Sharon Greer, Ed Seaver, Steve Phillips, Louis Wild, Pat Pickle, Martha Stark Link, Margaret Baxter, Gail Robinson, Rose Ward, Diane Whittaker, Janie Icenhour, and Lolita Cannaday) and to other persons (Jane Baxter and DeVere Ramsay) who contributed to various stages of this project. Fred Mayo, a psychology major, built the apparatus. Sincere appreciation is expressed to the officials, principals, and teachers in the Bristol, Tennessee, school system for their generous cooperation, especially to James Thomas, Superintendent; Margaret Brockman, Principal; and Elizabeth Hickam, Principal.

The study of altruistic behavior in children has become a massive research area. One focus of research since about 1960 has been the important question of how children learn to be altruistic or how they internalize altruistic tendencies.

Aronfreed (1968, Aronfreed & Paskal, 1965) gave first and third grade girls a chance to press a level on a machine to receive M & M candy or to press another lever to turn on a light, each lever operating on a 60% schedule. In his experiment he found that a specific physical cue (the light and lever) and a clear verbal cue (the experimenter's expression of delight at seeing the light) had to be paired contiguously with a feeling of warmth and positive affect in the child (the experimenter hugged and smiled at the child) to make it possible for the child later to press the light lever to give delight to the experimenter. Aronfreed concluded the internalization of altruistic mediation was directly under the control of affective factors. Midlarsky and Bryan (1967) replicated Aronfreed's study adding other experimental conditions, and obtained the same results that affective relationships and cues made internalization of the norm of self sacrifice possible. Rosenhan (1969) did not question the affective factor operating in a child's giving gift certificates won in a bowling game to an orphans fund. However, he added a cognitive treatment in the form of elaboration on the needs of the orphans and obtained a significantly higher rate of sharing. He concluded each child had a "cognitive-affective matrix" in which the cognitive structure played a part in determining whether the child would imitate a model who shared, but Rosenhan reported no effort to separate the two components of the matrix to determine whether the cognitive factor alone could lead to internalization. In fact, the cognitive treatment was inserted toward the end of the experiment after any affective factors had already had their effect.

This age-old question of the cognitive versus the affective remains an important question not only with reference to the learning of altruistic behavior but also with refevence to a conception of the nature of man.

The current study attempted to test cognitive effects with a minimum of affective effects by adapting the conditions and procedures of Aronfreed's design

and machine. Aronfreed's design had the particular advantage that the child had no prior acquaintance with this particular type of machine or with a person who is so enthralled with a simple light. Possibly, then, this kind of sharing is something new for each child to which he would not bring Rosenhan's "well-prepared cognitive affective matrix". From Aronfreed's design (Table 1) the condition which established the affective bond was eliminated, and a condition which did not produce sharing was selected. To it were added a control condition, and a cognitive treatment condition based on Rosenhan's success in adding cognitive details and on an early finding by Hartshorne, May, & Maller (1929) that a story told and discussed after the experimental manipulations led to expressions of greater interest in being altruistic. Unlike these two studies, the current study arranged to tell the story prior to the situations in which altruism was to be tested.

Table 1

Aronfreed:	Treatment 1	Treatment 2	Treatment 3
	Child was hugged and given a smile when the light came on.	E said "There's the light" with joy when the light came on.	Treatments 1 & 2 were combined. This condition produced the high sharing of Aronfreed's subjects.
Current study:	**Condition 1**	**Condition 2**	**Condition 3**
	Control: the E demonstrated the machine for the child, but made no response to the appearance of bubble gum or to the light. The child was told he could keep any bubble gum that came out of the machine.	Same as Treatment 2 above.	Same as Treatment 2 above, but these subjects had earlier received a cognitive treatment in the form of a story.

The story was written by a person familiar with the thinking of lower-grade children and depicted a like-sex child who used her/his own pennies to buy things for another child who wanted them although the owner of the pennies did not like or even abhorred those things. Thus, the story involved a situation very unlike

the experimental situation to follow, but including a similar idea. The school principal had announced two different groups would be visiting the school that week so children who heard the story saw no connection between it and the other portion of the experiment to which they were taken later in the day. The children who heard the story were told it might be used in a children's book if children thought it was a good story.

After each child had received her introduction to the machine and had 30 trials, she was given a bag of 20 pieces of bubble gum, in lieu of the bag attached to the machine, for having helped to test the machine. She was then led behind a screen where a box and two pictures of needy children were located and was told she could put as many pieces of her bubble gum in the box as she wanted to give to children who had none. The E then left the room saying she would not return.

Experiment I

The first experiment used girls from the first, second, third, and fourth grades of a middle to lower-middle class elementary school in a city with a population of about 55,000. The story teller and the experimenter were female. The results from the machine situation are presented at the left below, and the results from the charity box are presented at the right below in Table 2.

Table 2

	Machine (30 Trials)			Charity Box (20 pieces of gum		
	Condition 1 Control	Condition 2 "There's the light".	Condition 3 Story & "There's the light".	Condition 1 Control	Condition 2 "There's the light".	Condition 3 Story & "There's the light".
Grade 1	N = 7 M = 11.71	N = 7 M = 15.86	N = 7 M = 11.86	N = 7 M = 2.43	N = 7 M = 4.86	N = 7 M = 9.57
Grade 2	N = 8 M = 10.63	N = 8 M = 13.38	N = 8 M = 16.25	N = 8 M = 3.63	N = 8 M = 8.25	N = 8 M = 11.50
Grade 3	N = 8 M = 12.13	N = 8 M = 15.63	N = 8 M = 18.13	N = 8 M = 9.50	N = 8 M = 7.63	N = 8 M = 18.25
Grade 4	N = 7 M = 13.14	N = 7 M = 15.43	N = 7 M = 17.00	N = 7 M = 9.00	N = 7 M = 11.14	N = 7 M = 17.71

Source of Variation	F	Significance Level	Source of Variation	F	Significance Level
Grade level	2.04	N.S.	Grade level	7.42	$p < .001$
Treatments	9.50	$p < .001$	Treatments	17.01	$p < .0001$
Interaction	1.54	N.S.	Interaction	.74	N.S.

In grades 2 through 4, the results in Condition 3 were significantly different from Condition 1, but Condition 2 was not significantly different from Condition 1.

In Condition 3 taken separately there was a significant difference across grade levels ($p < .02$).

In grades 1 through 4, the results in Condition 3 were significantly different from Condition 1, but Condition 2 was not significantly different from Condition 1.

Experiment II

The second experiment used boys from the first, second, third, and fourth grades of a middle to upper-middle class elementary school in the same city. The story teller and the experimenter were male. The results from the machine situation are presented at the left below, and the results from the charity box are presented at the right below in Table 3.

Table 3

Machine (30 Trials)

	Condition 1 Control	Condition 2 "There's the light".	Condition 3 Story & "There's the light".
Grade 1	N = 8 M = 14.25	N = 8 M = 11.88	N = 8 M = 20.13
Grade 2	N = 8 M = 11.63	N = 8 M = 13.50	N = 8 M = 16.38
Grade 3	N = 8 M = 9.13	N = 8 M = 9.88	N = 8 M = 16.50
Grade 4	N = 7 M = 9.14	N = 7 M = 12.00	N = 7 M = 16.42

Source of Variation	F	Significance Level
Grade level	2.53	N.S.
Treatments	15.79	$p < .0001$
Interaction	.69	N. S.

In grades 2 through 4, the results in Condition 3 were significantly different from Condition 1, but Condition 2 was not significantly different from Condition 1.

Charity Box (20 pieces of gum)

	Condition 1 Control	Condition 2 "There's the light".	Condition 3 Story & "There's the Light".
Grade 1	N = 8 M = 8.5	N = 8 M = 8.63	N = 8 M = 17.50
Grade 2	N = 8 M = 10.00	N = 8 M = 8.25	N = 8 M = 14.63
Grade 3	N = 8 M = 8.75	N = 8 M = 6.75	N = 8 M = 14.63
Grade 4	N = 7 M = 6.71	N = 7 M = 7.14	N = 7 M = 15.57

Source of Variation	F	Significance Level
Grade Level	.63	N.S.
Treatments	24.34	$p < .0001$
Interaction	.41	N.S.

In grades 1 through 4, the results in Condition 3 were significantly different from Condition 1, but Condition 2 was not significantly different from Condition 1.

Experiment III

The third experiment used second grade girls who had never before been exposed to the study, and who were attending a school of middle to lower middle socio economic class level. The story teller and the experimenter were again females. The question asked was whether the cognitive treatment would continue to have an effect over time. Only Condition 3 was used in this experiment with the girls being tested on the machine and charity box on the same day, or on the third day, or on the fifth day following the story treatment. The results are presented in Table 4 below.

Table 4

Machine (30 Trials)			Charity Box (20 pieces of gum)		
Test on same day as story	Test on 3rd day after story	Test on 5th day after story	Test on same day as story	Test 3rd day after story	Test 5th day after story
N = 10 M = 13.7	N = 10 M = 17.9	N = 9 M = 17.6	N = 10 M = 14.3	N = 10 M = 15.5	N = 9 M = 13.1

Source of Variation	F	Significance level	Source of Variation	F	Significance level
Time periods	1.73	N.S.	Time periods	.53	N.S.

The analysis of variance showed there was no difference in the effect even on the fifth day.

Conclusion and Discussion

The study was conducted not to challenge the fact that affectionate relationships can play a part in the child's learning of altruistic behavior, nor to claim the affective can be completely eliminated or compartmentalized, but to test whether cognition is also a crucial and determinative factor. Specifically, the question was whether or not the child could store indirect information about altruism and later use it without benefit of Aronfreed's (1968) affective conditioning.

The results clearly indicate the child of grades 2 to 4 can do so in both familiar circumstances (the charity box) and in new and unusual situations (the machine), and the effect lasts for at least five days. The results for grade 1 show that children respond to the cognitive treatment in the familiar situation of the charity box but seem confused in the new and complex situation of the machine and the light-loving adult, suggesting the cognitive development of the first graders was not sufficient to handle such a novel experience. Grade level differences in the middle to lower-middle class school and the absence of grade difference in the middle to upper-middle class school could also suggest a cognitive response was being manipulated since cognitive development could be assumed to be more adequate in the latter

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school than in the former where the effectiveness of the cognitive treatment seem to have corresponded to cognitive development that goes with increasing age.

The results of this study are supported by the recent successful manipulation of an "I" orientation versus a "We" orientation by Rogers and Hudson (1974), but disagree with the negative results obtained by Walbek (1969) and Bryan and Walbek (1970), who found moral admonitions did not increase altruistic behavior. The results of the current study suggest examples chosen to fit the child's experience and cognitive development may be more effective than familiar, or grandiose, or abstract preachments.

Since much recent research on altruism in children has centered on modeling effects, and also on reinforcement effects, some may attempt to interpret this study under one of these two paradigms, but it should be noted the story situation was not specific to the test experience as most of the modeling studies are, and the child in the story obtained no tangible rewards.

This study does suggest the need to investigate prior antecedents of current altruistic behavior. No studies have assessed and equated for the child's altruistic behavior, attitudes, and experiences prior to the study, nor have specific references to and discussions about sharing that the child may have heard in the home been explored. Possibly parents need to pay more attention to such values in relating to their children, and school materials should be assessed for their emphasis on altruistic values. At the same time, it should be recognized that many variables do affect the child's learning or internalization of altruistic behavior.

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